AF/3644 EJW

PTO/SB/21 (09-04)
Approved for use through 07/31/2006. OMB 0651-0031
U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

TRANSMITTAL FORM

(to be used for all correspondence after initial filing)

Total Number of Pages in This Submission

Application Number	10/615,673
Filing Date	October 15, 2001
First Named Inventor	Moe
Art Unit	3644
Examiner Name	Tien Quang Dinh
Attorney Docket Number	104874-142119

ENCLOSURES *(Check all that apply)*

- ☑ Fee Transmittal Form
- ☐ Fee Attached
- ☐ Amendment/Reply
  - ☐ After Final
  - ☐ Affidavits/declaration(s)
- ☐ Extension of Time Request
- ☐ Express Abandonment Request
- ☐ Information Disclosure Statement
- ☐ Certified Copy of Priority Document(s)
- ☐ Reply to Missing Parts/ Incomplete Application
  - ☐ Reply to Missing Parts under 37 CFR 1.52 or 1.53
- ☐ Drawing(s)
- ☐ Licensing-related Papers
- ☐ Petition
- ☐ Petition to Convert to a Provisional Application
- ☐ Power of Attorney, Revocation Change of Correspondence Address
- ☐ Terminal Disclaimer
- ☐ Request for Refund
- ☐ CD, Number of CD(s) _____
  - ☐ Landscape Table on CD
- ☐ After Allowance Communication to TC
- ☐ Appeal Communication to Board of Appeals and Interferences
- ☑ Appeal Communication to TC **(Appeal Notice, Brief, Reply Brief)**
- ☐ Proprietary Information
- ☐ Status Letter
- ☐ Other Enclosure(s) (please Identify below):

Remarks

SIGNATURE OF APPLICANT, ATTORNEY, OR AGENT

Firm Name	Goodwin Procter LLP		
Signature			
Printed name	Louis S. Sorell		
Date	October 17, 2005	Reg. No.	32,439

CERTIFICATE OF TRANSMISSION/MAILING

I hereby certify that this correspondence is being facsimile transmitted to the USPTO or deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

Signature			
Typed or printed name	Louis S. Sorell	Date	October 17, 2005

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

APPLICANTS:	Moe *et al.*	GROUP ART UNIT:	3644
SERIAL NO.:	10/615,673		
FILING DATE:	October 15, 2001	EXAMINER:	Dinh, Tien Quang
TITLE:	METHOD AND APPARATUS FOR NOISE ABATEMENT AND ICE PROTECTION OF AN AIRCRAFT ENGINE NACELLE INLET LIP		

Mail Stop Appeal Brief – Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

I hereby certify that this paper is being deposited with the United States Postal Service with sufficient postage as first class mail in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450 on the date shown below:

October 17, 2005
Date of Deposit

Louis S. Sorell
Attorney Name

32,439
PTO Registration No.

Signature

October 17, 2005
Date of Signature

APPEAL BRIEF

This Appeal Brief is submitted in accordance with 37 C.F.R. § 41.37 and in furtherance of the Notice of Appeal filed August 4, 2005, in support of the appeal from final rejection of pending claims in the above-identified application. The Commissioner is hereby authorized to charge undersigned counsel's deposit account number 06-0923 with reference to docket number 104874-142119 the fee of $500.00 to cover the fee for filing this Appeal Brief as specified in 37 C.F.R. § 41.20(b)(2).

Appellants believe that a one (1) month extension-of-time fee of $120.00 is due for this Appeal Brief to be entered and considered pursuant to 37 C.F.R. § 41.31(d), 37 C.F.R. §

1.136(a)(1) and 37 C.F.R. § 1.17(a). Accordingly, it is respectfully requested that this paper be considered a petition for the one (1) month extension of time. The Commissioner is hereby authorized to charge the $120.00 fee due for the one (1) month extension of time, as well as any additional fees that may be due, for further extensions of time or any other purpose associated with this submission, or credit any overpayment, to Appellants' undersigned counsel's deposit account number 06-0923 with reference to docket number 104874-142119.

REAL PARTY IN INTEREST

The real party in interest in this appeal is Rohr Inc., the assignee of the above-identified patent application, pursuant to an assignment recorded in the records of the U.S. Patent and Trademark Office on December 22, 2003, at Reel 014819, beginning at Frame 0782.

RELATED APPEALS AND INTERFERENCES

There are no other appeals or interferences pending in the above-identified application that will directly affect or will be directly affected by the Board's decision in the present appeal.

STATUS OF CLAIMS

The application as filed contained Claims 1-20. During prosecution, Claims 14, 15, and 17-20 were cancelled. Pending Claims 1-13 and 16 have been finally rejected and are the subject of this appeal.

STATUS OF AMENDMENTS

In further response to the Final Office Action mailed on March 8, 2005, a Supplemental Amendment after Final Rejection was filed on May 27, 2005. According to the Advisory Action mailed July 5, 2005, the Supplemental Amendment After Final Rejection has been entered. No further amendments were filed subsequent to the Advisory Action.

SUMMARY OF CLAIMED SUBJECT MATTER

The invention generally relates to an apparatus for achieving both noise abatement and ice protection in the nacelle inlet lip of a gas turbine engine. The desired noise abatement and ice protection capabilities are achieved by a unique approach through the combination of an electrically powered ice protection system located on the nacelle inlet lip skin, wherein the surface of the inlet lip skin is an acoustically porous skin of a honeycomb core noise abatement structure.

Independent Claim 1 relates to an acoustic panel for use in the inlet lip portion of a gas turbine nacelle which includes a solid back skin, an acoustically permeable front skin, a honeycomb cell structure located between the front and back skin, and an ice protection system affixed to the front skin. The ice protection system includes an acoustically permeable and electrically and thermally conductive structure which in turn includes means for connection to an electrical power source, and the structure is thermally insulated from the front skin. The "means for connection to an electrical power source" set forth in Claim 1 are described as wiring or other conventional techniques at paragraphs [0013] and [0031] of the specification, or a temperature sensor installed in a closed loop scheme with an electronic controller as described in paragraph [0034] of the specification and depicted in Figure 3 of the drawings.

Independent Claim 16 relates to an inlet for an aircraft gas turbine engine nacelle which includes an acoustical panel structure including a solid back skin, an acoustically permeable front skin, and a honeycomb cell structure there between, and an ice protection system located on the front skin. The ice protection system includes an acoustically permeable and electrically and thermally conductive structure in electrical connection to an electrical power source, and the ice protection system is thermally insulated from the front skin.

GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The grounds of rejection to be reviewed are as follows:

(I) Claims 1-9 and 16 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable as obvious over U.S. Patent No. 4,291,079 to Hom *et al.* (hereinafter "Hom") or

U.S. Patent No. 5,653,836 to Mnich *et al.* (hereinafter "Mnich") in view of U.S. Patent No. 3,800,121 to Dean *et al.* (hereinafter "Dean").

(II) Claims 10-13 stand finally rejected under 35 U.S.C. § 103(a) as being unpatentable as obvious over Hom and Mnich in view of Dean and further in view of U.S. Patent No. 4, 514,619 to Kugelman *et al.* (hereinafter "Kugelman") or U.S. Patent No. 4,036,457 to Volkner *et al.* (hereinafter "Volkner").

ARGUMENT

For reasons set forth below, Appellants respectfully appeal the final rejection of Claims 1-13 and 16. In the ensuing argument, we address each of the Examiner's grouped rejections in turn pursuant to 37 C.F.R. § 41.67(c)(1)(vii).

I. Claims 1-9 and 16 constitute nonobvious subject matter and are patentable under 35 U.S.C. § 103(a) over Hom or Mnich in view of Dean.

Independent Claim 1 is directed to an acoustic panel for use in the inlet lip portion (exemplified by (20) in Figures 1 and 2A) of a gas turbine engine nacelle (exemplified by (21) in Figures 1 and 2A). The acoustic panel (exemplified by (104) in Figures 2A and 2B) includes a solid back skin (exemplified by (109) in Figures 2A and 2B), an acoustically permeable front skin (exemplified by (110) in Figures 2A and 2B), a honeycomb cell structure (exemplified by (108) in Figures 2A and 2B) located between the front skin and back skin, and an ice protection system which includes an acoustically permeable and electrically and thermally conductive structure (exemplified by (112) in Figures 2A and 2B), which includes means for connection to an electrical power source, in which the ice protection system is thermally insulated from the permeable front skin.

Claims 2-9 are ultimately dependent from and therefore incorporate the limitations of Claim 1.

Independent Claim 16 is directed to an inlet lip (exemplified by (20) in Figures 1 and 2A) for an aircraft gas turbine engine nacelle (exemplified by (21) in Figures 1 and 2A). The inlet lip includes an acoustic panel (exemplified by (104) in Figures 2A and 2B) which includes a solid back skin (exemplified (109) in Figures 2A and 2B), an acoustically permeable front skin (exemplified by (110) in Figures 2A and 2B), a honeycomb cell structure therebetween (exemplified by (108) in Figures 2A and 2B), and an ice protection system which includes an acoustically permeable and electrically and thermally conductive structure (exemplified by (112) in Figures 2A and 2B) in electrical connection to an electric power source, in which the ice protection system is thermally insulated from the permeable front skin.

Hom is directed to a method of manufacturing a honeycomb noise attenuation panel and the resulting panel, which as depicted in Figure 1 of Hom comprises a single honeycomb core (10), an imperforate facing sheet (16), a perforated facing sheet (14) and a thin sheet of porous fibrous material (20). *See* Hom, col. 2, lines 40-49 and Figure 1. Mnich is directed a method for repairing a sound attenuation structure for aircraft engine noise and the resulting repaired structure. As depicted in Figure 1 of Mnich, the repaired structure (10) comprises a single honeycomb core (12), a thin imperforate back facing sheet (16), a thin perforated sheet (18) and a thin sheet of porous wire cloth (22) which is adhesively bonded to the underlying perforated sheet (18). *See* Mnich, col. 2, lines 43-64 and Figure 1. As admitted by the Examiner, although Hom and Mnich disclose acoustic panels, they are silent as to incorporation of an ice protection system and an insulation element. *See* Final Office Action mailed March 8, 2005, p. 2. More particularly, Hom and Mnich are both silent as to the incorporation of an ice protection system which is acoustically permeable, and thermally and electrically insulated from the facing sheet of the acoustic panels described therein.

In an attempt to overcome these deficiencies in Hom and Mnich, the Examiner has additionally cited Dean, which is directed to an electrical heating apparatus for reducing ice formation on aircraft parts. As depicted in Figure 2 of Dean, the apparatus of Dean as employed on a non-perforated aircraft wing skin (10) has a layer of adhesive (11) applied to the outer surface of non-perforated wing skin (10) and a metallic conducting layer (12) in the form of a metal foil sheet applied to adhesive (11). Insulating layer (13) is applied to the outer surface of metallic layer (12), insulating layer (15) is applied to the outer surface of metallic layer (14), and

paint layer (16) is applied to the outer surface of insulating layer (15). *See* Dean, col. 1, line 60 – col. 2, line 21 and Figure 2. The Examiner has asserted that one of ordinary skill in the art at the time of invention of the subject matter of Claims 1-9 and 16 would have found these claims obvious in view of the combined teachings of Hom or Mnich in view of Dean.

However, as a threshold matter, the Examiner has failed to establish the *prima facie* obviousness of Claims 1-9 and 16. It is axiomatic that the mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination. *See* MPEP § 2143.01 at p. 2100-131 (Rev. 2, May 2004). Moreover, to establish *prima facie* obviousness based upon the assertion that the references relied upon teach that all aspects of the claimed invention were individually known in the art, the Examiner must provide some objective reason to combine the teachings of the references. *See id.* In other words, there must be some suggestion or motivation to combine the teachings of the references, and in addition, there must be a reasonable expectation of success resulting from the combination. *See, e.g.*, *In re Koztrab*, 217 F.3d 1365, 1370, 55 U.S.P.Q.2d 1313, 1316 (Fed. Cir. 2000) (to establish obviousness, there must be some suggestion, motivation, or teaching of the desirability of making the specific claimed combination). The teaching or suggestion to make the asserted combination and the reasonable expectation of success must both be found either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, not based on Appellants' disclosure. *In re Vaeck*, 947 F.2d 488, 493, 20 U.S.P.Q.2d 1438, 1442 (Fed. Cir. 1991).

In the present case, the Examiner has failed to provide any reason why one of ordinary skill in the art aware of the noise attenuating acoustic panels of Hom or Mnich would have been motivated to look to the ice protection system of Dean. Noise attenuation (as in Hom and Mnich) is an environmental issue, whereas aircraft ice protection (as in Dean) is an aircraft safety and operability issue. The Examiner has offered no explanation as to why one of ordinary skill in the art would look to combine proposed solutions to the environmental problem of aircraft engine noise attenuation (*i.e.*, Hom or Mnich) with a proposed solution to the aircraft safety and operability problem of ice formation (*i.e.*, Dean). Moreover, the Examiner has failed to explain why one of ordinary skill in the art would seek to combine an ice protection system used on a solid surface such as an aircraft wing (as in Dean) on perforated acoustic panels (as in Hom and

Mnich). Accordingly, in view of the failure of the teachings of the cited prior art to suggest the combination of Hom or Mnich with Dean, the Examiner is impermissibly employing hindsight in combining the acoustic panels of Hom or Mnich and the ice protection system of Dean. *See, e.g., In re Skoll*, 523 F.2d 1392, 1396, 187 U.S.P.Q. 481, 484 (CCPA 1975) (the prior art references, viewed by themselves and not in retrospect, must suggest doing what the applicant had done).

In addition, even assuming *arguendo* that one of ordinary skill in the art would be motivated to combine the acoustic panels of Hom or Mnich with the ice protection system of Dean, such a combination does not establish a *prima facie* case of obviousness of Claims 1-9 and 16. To establish a *prima facie* case of obviousness, every element of the invention as claimed must be found in the prior art. *See In re Rouffet*, 149 F.3d 1350, 1357, 47 U.S.P.Q.2d 1453, 1457 (Fed. Cir. 1998). However, the combination of Hom or Mnich with Dean does not fulfill this requirement.

More particularly, all of Claims 1-9 and 16 require an acoustic panel having an ice protection system including an acoustically permeable and electrically and thermally conductive structure. As admitted by the Examiner, Hom and Mnich disclose acoustic panels, but are silent as to the incorporation of an ice protection system. The Examiner has asserted that Dean teaches an ice protection system that has an acoustically permeable and electrically and thermally conductive structure. *See* Final Office Action, p. 2. However, Dean et al. fails to make <u>any</u> statement regarding the acoustic permeability of its ice protection system. Moreover, as discussed above, Figure 2 of Dean depicts the adhesive layer (11) applied to the wing skin (10), the metal foil sheet (12) applied to the skin (10), the metal foil sheet (12) applied to the adhesive layer (11), the insulating layer (13) applied to the sheet (12), the metallic layer (14) applied to the outer surface of the insulating layer (13), the insulating material (15) applied to the metallic layer (14) and the paint layer (16) applied to the insulating layer (15). *See* Dean, Fig. 2 and col. 1, line 60-col. 2, line 21. The Examiner has failed to offer any objective evidence that these non-perforated layers are acoustically permeable, either alone or in combination. Thus, the Examiner has failed to establish that Dean discloses or suggests an ice protection system having an acoustically permeable structure. Accordingly, the Examiner's conclusion that the ice protection

system of Dean is acoustically permeable is pure speculation, and is unsupported by any objective evidence of record.

Moreover, even if one of ordinary skill in the art would have been motivated to combine the acoustic panels of Hom or Mnich with the ice protection of Dean, there is no teaching or suggestion that the multi-layered, insulated structure of Dean could successfully be employed as an acoustically permeable structure. In fact, such a combination would impermissibly change the basic principle of operation of Dean, which is the use of its multi-layered ice protection system on a solid surface such as wing skin (10), not a perforated or acoustically permeable structure as disclosed by Hom or Mnich. *See In re Ratti*, 270 F.2d 810, 813, 123 U.S.P.Q. 349, 352 (CCPA 1959).

Finally, as noted at paragraph [0009] of the specification as filed, the prior art hot air aircraft de-icing systems are incompatible with the relatively low temperature capability adhesively bonded honeycomb noise abatement structures (such as the acoustic panels of Hom and Mnich). Thus, there is a long-felt but unsolved need in the art for providing a de-icing system which is compatible with the relatively low temperature capability of adhesively bonded honeycomb noise abatement structures. The present invention as set forth in Claims 1-9 and 16 satisfies this long-felt but unsolved need, and therefore is nonobvious in view of the prior art.

Accordingly, for at least the reasons discussed above, the Examiner's rejection fails to satisfy the requirements of 35 U.S.C. § 103, and Claims 1-9 and 16 are nonobvious in view of the cited prior art.

II. Claims 10-13 constitute nonobvious subject matter and are patentable under 35 U.S.C. §103 (a) over Hom or Mnich in view of Dean, further in view of Kugelman or Volkner.

Claims 10-13 directly or indirectly depend from Claim 1 and include all the limitations thereof. As discussed above, Claim 1 is patentable over Hom or Mnich and Dean. Kugelman or Volkner do not cure the deficiencies of Hom or Mnich and Dean, because neither teach an ice

protection system that has an acoustically permeable structure. Accordingly, Claims 10-13 are nonobvious in view of the cited prior art.

CONCLUSION

In view of the arguments above, Appellants respectfully submit that Claims 1-13 and 16 are patentable and urge the Board of Patent Appeals and Interferences to reverse all of the Examiner's rejections as to each of these claims.

Respectfully submitted,

Date: October 17, 2005

Louis S. Sorell (Reg. No. 32,439)
GOODWIN PROCTER LLP
599 Lexington Avenue
New York, New York 10022
(212) 459-7421

CLAIMS APPENDIX

1. An acoustic panel for use in the inlet lip portion of a gas turbine nacelle, the panel comprising: (a) a solid back skin; (b) an acoustically permeable front skin; (c) a honeycomb cell structure located between the front skin and back skin; and (d) an ice protection system affixed to the front skin, wherein the ice protection system includes an acoustically permeable and electrically and thermally conductive structure which includes means for connection to an electric power source, and the structure is thermally insulated from the front skin.

2. The acoustic panel of Claim 1, in which the ice protection system includes a low power electronic ice protection system.

3. The acoustic panel of Claim 1, in which the acoustically permeable front skin is perforated.

4. The acoustic panel of Claim 1, in which the honeycomb structure is adhesively bonded to the front skin and the back skin.

5. The acoustic panel of Claim 1, in which the front skin and the back skin are each an aluminum sheet material.

6. The acoustic panel of Claim 1, in which the front skin, back skin and honeycomb cell structure are each a graphite/epoxy laminate.

7. The acoustic panel of Claim 1, in which the ice protection system includes a stainless steel wire mesh adhesively bonded to the outer surface of the front skin.

8. The acoustic panel of Claim 1, in which a permeable, thermally insulating material is located between the electronic ice protection system and the front skin.

9. The acoustic panel of Claim 8, in which the insulating material is adhesively bonded to the outer surface of the front skin, and the electronic ice protection system is adhesively bonded to the insulating material.

10. The acoustic panel of Claim 1, in which the nacelle has a highlight, and a parting strip is located proximate to the nacelle highlight.

11. The acoustic panel of Claim 10, in which the parting strip is an electrified grid material which carries a watt density of up to about 20W/sq. in.

12. The acoustic panel of Claim 1, in which the ice protection system comprises a plurality of sections which extend around the circumference of the inlet lip of the nacelle.

13. The acoustic panel of Claim 12, in which power is supplied selectively or sequentially to the sections.

16. An inlet lip for an aircraft gas turbine engine nacelle, the inlet lip comprising: (a) an acoustic panel structure including a solid back skin, an acoustically permeable front skin, and a honeycomb cell structure there between; and (b) an ice protection system located on the front skin, wherein the ice protection system includes an acoustically permeable and electrically and thermally conductive structure in electrical connection to an electric power source, and the ice protection system is thermally insulated from the permeable front skin.